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An examination of parent buy-in for families with children who are deaf or hard of hearing using a teleintervention service delivery model

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AN EXAMINATION OF PARENT BUY-IN FOR FAMILIES WITH CHILDREN WHO ARE DEAF OR HARD OF HEARING USING A TELEINTERVENTION SERVICE DELIVERY MODEL

by

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Abstract: This literature review examines the effectiveness of teleintervention on creating parent buy-in and greater outcomes for children who are deaf or hard of hearing using a listening and spoken language approach.

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I. Introduction

Tele-, the Greek root word for, "distance" or "remote," lends itself well to the naming of a service delivery model that has developed due to advancements in technology. Used across a spectrum of medical fields and known by many names, the delivery of services utilizing a two-way video conferencing platform has revolutionized the ways in which professionals are able to communicate with clients. Medical practitioners refer to this service delivery model as telemedicine, while Speech-Language Pathologists (SLP) refer to it as telepractice. According to Soyars, Simoneaux, DuBay, and O'Rourke's article, "Tomorrow's Service Delivery Model: Telepractice & You:"

> The first reported use of telepractice in the field of speech language pathology occurred in the mid 1970s at the Birmingham VA Hospital to help serve clients in remote locations. The clinicians used the telephone to provide services as well as a teaching machine that used filmstrips and supplementary materials such as workbooks and audiotapes for additional practice (Soyars, Simoneaux, DuBay, & O'Rourke, n.d.).

Since the 1970's, the development of the Internet and the ever-growing prevalence of Internet access have allowed for two-way video conferencing to help clinicians of all kinds reach clients in distant or remote locations. This model lends itself well to the practice of early intervention (EI) with children who are deaf or hard of hearing who use listening and spoken language, as it allows service providers to reach families who may not have access to early intervention services. Further, telepractice upholds the requirement of Part C of the Individuals with Disabilities Education Act (IDEA), which requires that services be provided in the most natural environment (IDEA, 2004). Teleintervention is an early intervention service delivery model

developed for accessing children with hearing loss, from birth to age three, and their families. Though teleintervention was developed to reach children and families in remote locations, its effectiveness is encouraging the field of deaf education to move toward utilizing this model of service delivery more often.

Early intervention services have existed for many years and have traditionally been provided in the home. Currently, the prevalence of teleintervention services is on the rise in the field of deaf education. The National Center for Hearing Assessment and Management (NCHAM) surveyed Early Hearing Detection and Intervention (EHDI) coordinators and the survey revealed, "42% of the state EHDI programs had some type of telepractice underway or were in the planning stages for implementation" (NCHAM, 2010). The term, "teleintervention," was coined by the Sound Beginnings Program at Utah State University, during a pilot study utilizing two-way video conferencing. According to the Sound Beginnings Program, "Teleintervention, a specific model of early intervention provided through telepractice, provides family-centered services to infants, toddlers, and young children with hearing loss and allows the provider to model strategies and coach parents in the use of language facilitation techniques" (Houston & Stredler-Brown, 2012). Teleintervention programs are currently being developed to reach families in need, however, in the populous city of Sydney, Australia, mainstreamed students with hearing loss are receiving supplemental teleintervention services to support their education (McCarthy, Duncan, & Leigh, 2012). This implies that teleintervention is worth utilizing despite the family and child's location. As the service delivery model for early intervention begins to broaden, it is vital that the implications of this shift are examined.

Early intervention is a family-centered approach, which means this shift will affect families as a whole. When service providers enter into the home to work with children with

hearing loss and their caregivers, it is imperative that they form a relationship in which the parents are invested in their child's development and the service provider is dedicated to coaching the parents. This requires a collaborative relationship, in which the service provider models and coaches, the parent practices providing intervention strategies for their child, and the child is being looked at as a whole. Developing this collaborative relationship is imperative to creating parent buy-in, which is the idea that the parents of a child with hearing loss have fully committed to learning and implementing strategies and techniques for facilitating their child's development of listening and spoken language. It is the hypothesis of this literature review that qualified EI providers delivering teleintervention services to families with children who are deaf or hard of hearing who have chosen a listening and spoken language outcome, create greater parent buy-in and as a result see greater outcomes for children, than in the traditional in-home service delivery model.

II. Importance of Early Intervention for Children who are Deaf or Hard of Hearing

Early Intervention is described in Part C of IDEA as,

> Developmental services that…are designed to meet the developmental needs of an infant or toddler with a disability, as identified by the individualized family service plan team, in any 1 or more of the following areas: (i) physical development; (ii) cognitive development; (iii) communication development; (iv) social or emotional development; or (v) adaptive development (IDEA 2004).

Further, IDEA mandates that the EI services be provided in the most natural environment, which is described as the, "settings that are natural or normal for the child's same aged peers who have no disabilities." EI is imperative in the field of deaf education, because children have a critical period for learning language that occurs within the first few years of life. The brain at birth and

through the first few years of life maintains a high level of plasticity, allowing it to adapt more easily to auditory input through an amplification device, such as a hearing aid or cochlear implant. The older a child gets, the less plasticity their brain maintains, resulting in a more difficult transition from a lack of auditory input to receiving auditory input through an amplification device and subsequent language development (Cole & Flexer, 2010).

According to the American Speech-Language-Hearing Association (ASHA) website, "92% of children with permanent hearing loss are born to two hearing parents." With the percentage of children with hearing loss born to hearing parents and the continual advancements in technology, the number of families who choose listening and spoken language for their children is on the rise. When a family chooses the listening and spoken language approach, there are many strategies the parents can employ to make listening and spoken language meaningful for their child. The earlier the family and child receive EI services from a qualified professional, the greater the child's chance for success in learning to listen and talk. An EI provider can help the parents understand their child's hearing loss, act as a liaison between the parents and other hearing professionals (Audiologist, ENT, etc.), and aid the parents in learning strategies and techniques for helping their child develop listening and spoken language. According to a 2006 article by Kennedy and colleagues, "most children who are identified early as being deaf or hard of hearing and provided with appropriate early intervention are able to progress at age-appropriate rates" (Kennedy et al., 2006).

When parents learn about their child's hearing loss, they are likely to experience a variety of emotions. They will require a great deal of information and guidance as they navigate the journey of raising a child with hearing loss. The family component of EI is vital for a child to develop listening and spoken language. From birth to three years of age, a child spends the

majority of his time with his family, so parent, grandparent, sibling, and other care-provider involvement is critical. The EI provider serves the entire family, providing information, resources, and support, which makes EI services foundational to positive child outcomes. Acting as a coach, the EI provider helps family members realize their central role in the child's development of listening and spoken language. With a high level of parent buy-in, a child's chance for developing listening and spoken language is vastly greater, because parents are more likely to maintain device use and implement strategies for enhancing listening and spoken language (Moeller, 2000).

III. Traditional Service Model

Traditionally, early intervention services for children who are deaf or hard of hearing and whose parents have chosen a listening and spoken language outcome are provided in the family's home. The service provider typically spends an hour in the home working with the child and caregivers to facilitate the development of listening and spoken language. Though the traditional service model has shown great success in supporting families with children who are deaf or hard of hearing, there are barriers that may hinder the process. These barriers can result in families receiving services less often than is optimal, frequently from professionals who are under-qualified for working with children with hearing loss. Reasons may include: rurally located communities, a lack of qualified practitioners, limited funding, and service providers who rely on a therapy model, among other constraints.

A lack of services can often be attributed to a limited number of qualified service providers, if any at all, within rural communities. Deafness is a low incidence disability, which means children who are deaf or hard of hearing in rural locations rarely have immediate access to appropriate services. When services are available, the family may run into issues, such as a local

audiologist lacking expertise in pediatric audiology or the early intervention provider lacking experience working with children with hearing loss. This is a great disservice to a child learning to listen and talk. Even when a rural community does manage to employ a qualified professional, the turnover rate is high due to the professional's lack of professional support, limited resources, and extremely broad responsibilities (McCarthy et al., 2012).

The issue that EI providers face with families in rurally located communities is that they are often expected to drive upward of 2.5 hours to reach the families they serve. This may be due to the family's distant location from their service provider, or due to geographical or weather constraints. Providing services to these families often leads to cancelled appointments and/or reduced frequency of services, which can be detrimental to a child's developmental progress at such a critical time in the child's life. These issues may arise when services are being provided, however, the more critical issue is families in rurally located communities who do not receive services at all.

Compounding the constraints of rurally located families and a lack of qualified professionals is the cost of providing EI services in-home. When an EI service provider is driving great distances to spend a one-hour session with a family, the cost of the travel time, mileage, and in-home session can often add up to more than a program's funding can cover. This ultimately leads to services being cut or reduced, often leaving a family to receive qualified, yet limited expert services. When services cannot be provided due to a family's location, the cost burden often falls on the family, requiring them to travel great distances to receive appropriate services or relocate altogether.

Setting the aforementioned difficulties with the traditional service model aside, many families do have access to qualified service providers, in metropolitan areas, without difficulties funding such services. These families are provided with in-home EI services from a provider who is likely trained using a therapy model for intervention. This means that the EI provider is utilizing direct instruction with the child, with the expectation that the parents will carry the techniques they observe into their daily life. A number of findings have shown that on average, 51% of the interventionist's time is spent teaching the child directly, while less than 33% is spent engaged in adult interactions. Further, less than 1% of the time in the home is dedicated to coaching the parents as they interact with their children or modeling strategies for the parents (Peterson, Luze, Eshbaugh, Jeon, & Kantz, 2007). However, ASHA'S Early Intervention Workgroup stated their support for the role of a speech-language pathologist (SLP) in EI to be focused on supporting the caregivers so that they may become independently competent to enhance their child's development (ASHA 2008).

ASHA's goal for caregivers working with a SLP can be applied to the field of deaf education, which has led the field of early intervention to move toward a coaching model, in which the parent is coached by the EI provider, to be their child's primary interventionist. Even when the EI provider is trained in a family-centered approach for intervention, there is often, "a disparity between intentions and practice," according to Rush, Shelden, and Hanft in their 2003 article, "Coaching Families and Colleagues: A Process for Collaboration in Natural Settings" (Rush, Shelden, & Hanft, 2003). Though the EI provider may intend to coach the parent to be the primary provider for their child, the provider's knowledge and expertise often allow her to fall back into a comfort zone, in which she takes over to model the correct techniques for parents, or more often, teach the child directly. Despite the EI provider's good intentions, she is not only

taking away the independence from the parents, but she is reaffirming their insecurity to integrate the techniques independently into their daily routines. Due to this disparity, the EI provider is likely to model techniques or provide direct instruction to the child more often than coach the parents. In turn, the parents are likely to feel less confident and less responsible for providing intervention strategies for their child.

IV. A Typical Teleintervention Session

The basis of service delivery in teleintervetion is via two-way video conferencing. Teleintervention sessions can look different depending on the child and/or family's immediate needs, how long the family has been receiving teleintervention services, and what materials the family has access to. The implementation of teleintervention requires preparation on the part of the EI provider and the family. Both parties must have access to video conferencing technology and Internet access with the capability of supporting said technology. Further, there must be access to a communication line (phone, email, etc.) to schedule the teleintervention sessions.

In December 2010, Behl, Houston, Guthrie, and Guthrie wrote about a typical teleintervention session in their article, "Tele-Intervention: The Wave of the Future Fits Families' Lives Today." They stated that a teleintervention session typically occurs weekly for 60-75 minutes, but could occur more or less often, depending on the family's needs. The session usually begins with a discussion of the speech, language, and listening goals from the previous week's session and the EI provider determines if and how the techniques have been incorporated into the family's daily routines. The EI provider may also take this time to ask the parents about new occurrences that have emerged throughout the week, such as new speech sounds, behaviors, or language their child has used spontaneously (Behl, Houston, Guthrie, & Guthrie, 2010). The

EI provider can choose to include these new occurrences into the current session plan, if appropriate, or write them down to set goals for the following week.

Once the EI provider and parents have reconnected about the past week's events, the EI provider can lay out the goals for the current session. They may or may not have discussed these goals with the parents the week before or given the parents information via email, or another previously decided upon means of communication. Ideally, the parents will have the same or similar toys and everyday materials prepared, so that time can be used efficiently during the teleintervention session. The EI provider will demonstrate an activity first, then ask the parents to engage the child and repeat the activity, while the provider observes. This is when the EI provider's role shifts to a coaching model, rather than a therapy model of intervention. It is important that the provider gives positive reinforcement and constructive feedback to the parents throughout the session, so that they gain confidence in their ability to provide support to their child, yet provide intervention strategies correctly and effectively. Further, the EI provider should explain to the parents how these strategies promote listening and spoken language, to ensure that they understand the importance of the task and are therefore more likely to carryover the techniques into their everyday lives (Behl et al., 2010).

This process is repeated with a few different activities that promote listening and spoken language. Throughout the session, it is vital that the EI provider and parents gauge the child's attention level. If the EI provider notices that the parent is losing the child's attention, they can encourage one more attempt with the activity at hand, then move on, thereby preventing behavioral disruptions and a power struggle. Throughout the activities, the EI provider may jump in to encourage the parent to appropriately model and expand the child's language. Through practice and positive reinforcement in these activities, the parents will gain a natural style of

interaction in which they begin to implement the strategies they have learned and easily include them in other daily activities (Behl et al., 2010).

As the session comes to an end, the EI provider will recap the session's goals, the strategies that she modeled and the parents practiced, and emphasize the importance of these techniques for listening and spoken language. If the parents and child were successful, the EI provider and parents may brainstorm goals for the family to implement throughout the week and for the following week's session. Further, the parents are given time to address any concerns they may have about their child's development, devices, goals, or any other concerns that may arise (Behl et al., 2010). Teleintervention sessions usually occur regularly, like a traditional weekly or bi-weekly in-home session would, so discussion of time and place is generally unnecessary, but can be discussed at this time if there are any changes. Lastly, the EI provider and parents can discuss the best method for communication of anything necessary between sessions, such as results from the child's most recent hearing test, if they have an audiology appointment, or a text supplement the EI provider wants to share with the family.

V. How Teleintervention Addresses the Issues of the Traditional Service Model

Although the teleintervention process requires upfront effort and planning to be successful, there are aspects of two-way videoconferencing that address the issues posed by the traditional in-home service model. Families who are able to participate in teleintervention sessions benefit as much as, if not more than, families receiving in-home services. The factors of rurally located families, a lack of qualified practitioners, limited funding, and EI providers falling back on a therapy model can all be addressed through the implementation of teleintervention.

Since teleintervention brings the EI service provider directly to the families' homes, without a need for travel, the issues of rurally located families and a lack of qualified practitioners fade away. A family's location, geographical or weather constraints, are no longer an issue when a qualified practitioner is able to spend an hour with the family and child in the child's most natural environment via teleintervention. This also allows an EI service provider, who would otherwise be spending one-hour driving to and from an hour-long session with a family, to provide services to three families in the time it would otherwise take to provide services to one family.

When bypassing the EI providers travel time, the family receives services from a qualified practitioner more consistently and without unnecessary travel for either party. Further, the EI provider is able to serve more families, therefore providing cost-benefits to the family and provider alike. In their 2013 article, "Using Tele-Intervention for Children who are Deaf or Hard of Hearing," Behl, Blaiser, White, and Callow-Heusser investigated cost differences of providing in-home services versus teleintervention services. They found that, "if 3-4 visits per month were provided to each child…the cost savings for providing services to 15 families using TI [teleintervention] instead of in-person visits would be $56, 280 to $86,970 over a 24 month period" (Behl, Blaiser, White, & Callow-Heusser, 2013). Beyond rural locations, geographical and weather constraints, and the cost-benefit analysis, there are also fewer appointments missed due to illness and inconvenience. Finally, when the EI service provider is providing teleintervention services, they are unable to fall back on a therapy approach, since they are not in the same vicinity as the parent and child and therefore cannot take over the session. The EI service provider is forced to model and coach the parent in strategies and techniques that facilitate listening and spoken language development for the child (Hamren & Quigley 2012).

VI. Effective Coaching

Parents know their child best, which puts them in the unique position to be the primary interventionist in their child's life. To guide parents in this role, it is necessary for the EI provider to subscribe to a coaching model, rather than a therapy model. Coaching, as described by Rush and colleagues, is "an interactive process of observation and reflection in which the coach promotes a parent's or other care provider's ability to support a child's participation in everyday experiences and interactions with family members and peers across settings." A provider who has a strong understanding of the coaching model is best equipped to empower parents and allow them to take ownership of their child's intervention (Rush et al., 2003).

Parents who take ownership of their child's intervention are able to capitalize on teachable moments. These moments can arise at any time and it is therefore necessary that the parent is well coached and able to take advantage of such occurrences. The main goal of a coaching philosophy in early intervention is for the parents to gain knowledge and confidence in guiding their child's learning as they develop listening and spoken language. To reach this goal, a coaching relationship must be built, which is based on mutual respect, trust, and open communication. For an EI provider to utilize best practice in early intervention, Rush and colleagues adapted four conditions that lead to commitment between coaches and learners:

> (1) Developing clear understanding of core values, such as early intervention philosophy and rationale for the coaching model, as well as performance goals; (2) Ability to influence the coaching process; (3) Gaining the knowledge, skills, and confidence to do what learners want and need to do; (4) Appreciation for contributions from all partners in the relationship (Rush et al., 2003).

With a strong foundation in the tenets of best practice and an ability to create a balanced coaching relationship, an EI provider can best guide the families she works with to become confident interventionists for their children with hearing loss.

Rush and colleagues describe coaching as a five-phase process: initiation, observation or action, reflection, evaluation, and continuation or resolution. The initiation phase refers to the development of a collaborative relationship between the parents and EI providers, as well as the development and implementation of an Individualized Family Service Plan (IFSP), in which the parents and EI providers create specific outcomes. The observation phase is essential for the provider to learn about the family's needs and for the parent to learn intervention strategies from the provider. The action component takes place when the parent demonstrates the new skill she has learned from the provider; this can take place during the coaching session or through a conversation in which parents describe a successful interaction with their child. The reflection phase is guided by the provider asking the parent questions about her experiences and wants for her child and family, using reflective listening, and then leading the parent to an attainable goal. The evaluation phase refers to the effectiveness of the coaching process. Finally, the continuation or resolution phase occurs when the provider and parent discuss their session to learn from and develop a plan for the next coaching session or mutually agree that they have met the outcomes they had initially developed (Rush et al., 2003).

Understanding the five-phase process to effective coaching is imperative, but difficulty often arises when implementing this process. Successful implementation requires commitment by the key people in the child's life, mainly the parents or caregiver, who influence the child's life on a daily basis (Rush et al., 2003). It is important to remember that even the best EI service provider is only spending one-hour per week with the child, but the caregivers are with the child

all remaining waking hours, which makes them ideal interventionists for their child with hearing loss. The EI provider who understands the, "triadic relationship among the EI provider as a consultant, the caregiver, and the child," is well equipped for implementing such a relationship (Woods, Wilcox, Friedman & Murch, 2011). It is imperative that the EI provider recognizes that participants in this triadic relationship are experts, and with each of their specific sets of knowledge, the participants can work together toward the established outcomes. The EI provider is an expert in child development and facilitating listening and spoken language, while the parent or caregiver is an expert on her child, and the child is an expert at being a child. To enhance this relationship, it is the EI providers' responsibility to actively engage caregivers to participate and feel confident in the strategies and techniques for honing a child's listening and spoken language. This is accomplished through coaching.

VII. Current Literature on Teleintervention and Parent Buy-in

In 2012, Houston and Stredler-Brown explored issues surrounding early intervention services and ways in which teleintervention is beneficial in overcoming these issues. Through their investigation, the authors describe the process in which coaching leads to parent buy-in:

> As part of the coaching relationship…parents learn to reinforce appropriate listening, speech, and/or language targets during structured activities. As the parents' confidence grows, the…strategies are incorporated into the child's play and other daily routines. With practice, the parents' skills become more habitual and are readily transferred to other commonly occurring activities (e.g., bath time, dressing, setting the table). As a result of active engagement during telepractice sessions, parents are better equipped to integrate

communication and language goals into their child's typical routines (Houston & Stredler-Brown, 2012).

Further, in regards to the development of a child's listening and spoken language when utilizing teleintervention, the authors state, "Children have obtained language outcomes that are consistent with or exceed developmental norms. Additionally, parents report that they have more confidence assuming their role as their child's primary language facilitator" (Houston & Stredler-Brown, 2012).

Further studies show similar findings, such as Behl and colleagues 2013 study out of Utah State University, "Using Tele-Intervention for Children Who Are Deaf or Hard of Hearing." The study included twenty-seven families that were enrolled in the Utah Schools for the Deaf and Blind (USDB), who were then randomly assigned to either a teleintervention (TI) group or a traditional in-home group. Nine EI providers participated and served families in both groups. The twenty-seven children had no statistically significant differences in age, degree of hearing loss, or presence of additional disabilities. The families were scheduled to have 2 visits per month, over a 6-month period. The TI group received one session per month via two-way video conferencing, while the other session was provided in-home, as a requirement by the Utah State Department of Health (Behl et al., 2013).

Behl and colleagues measured *Home Visitor Facilitation of Parent-Child Interaction* and discovered that the EI provider facilitated more parent-child interactions in the TI group than the in-home group, which shows that the EI provider was coaching more effectively during the teleintervention session. The authors then measured *Parent Engagement during Home Visit* and found that, "*Parent Engagement during Home Visit* was statistically significant in favor of the TI

group at $p \leq .02$" (Behl et al., 2013). These measures show that there was not only more effective coaching during the teleintervention sessions, but as a result, also greater parent buy-in. Finally, the authors measured child outcomes and discovered that "children in the TI group made more progress in receptive and expressive language than children in the comparison [in-home] group" (Behl et al., 2013). Behl and colleagues stated, "Families receiving services via TI scored better on 6 of the 7 scales with an average Effect Size of 1.93 standard deviation units in favor of the TI group…Although the sample sizes are very small, such large differences in favor of the TI group are evidence that TI visits resulted in higher quality early intervention services" (Behl et al., 2013). This study provides evidence that teleintervention is a viable, possibly even preferential, option for delivering early intervention services, regardless of the child and family's distance from their provider.

Connect*Hear*, a teleintervention program established by Wisconsin's Center for Communication, Hearing, & Deafness was outlined by author Lalios, in her 2012 article, "Connect*Hear* TeleIntervention Program." According to parent surveys collected by the Connect*Hear* teleintervention program, "A relatively high level of satisfaction is reported (a score of 4.5 out of 5) regarding the effectiveness of telepractice to address the child's auditory, language, and speech needs" (Lalios, 2012). Additionally, families reported, "observation of progress in their child's skills and abilities as a result of participation in telepractice" (Lalios, 2012). Practitioners from the program further noted that the parents who participated in teleintervention sessions appeared more prepared to assume the role of primary facilitator of their child's development and therefore the parents' skills seemed to increase at a faster rate (Lalios, 2012). These studies show that through the use of teleintervention, not only was parent buy-in greater, but as a result, child outcomes for receptive and expressive language capabilities

were also greater when utilizing a teleintervention service delivery model as compared to the traditional in-home service delivery model.

Due to the very recent development of teleintervention services within the field of deaf education, the number of studies is still quite small. However, studies of the delivery of speech therapy and/or early intervention services via telemedicine can be generalized to the field of deaf education. Therefore, the results of such studies warrant attention in this literature review. In the 2010 article, "Using telepractice in parent training in early autism," Baharav and Reiser compared traditional in-person interventions (i.e., speech therapy twice per week in a clinic setting) to speech therapy interventions provided weekly in a clinic setting, followed by a remote session whereby the clinician coached the parent and provided real-time feedback via videoconferencing. The researchers concluded that the children's skills improved with both service delivery models, and parents perceived the sessions provided via telehealth to be as valuable as those provided by the clinician (Baharav & Reiser, 2010).

In a 2012 article, "An Evaluation of Virtual Home Visits in Early Intervention: Feasibility of 'Virtual Intervention,'" Olsen, Fiechtl, and Rule studied Virtual Home Visits (VHV) sessions provided to thirty-six families who participated in the Up to 3 Early Intervention Program at the Center for Persons with Disabilities at Utah State University. They evaluated several in-home visits for comparison purposes and included children in the study with a range of diagnoses, from periventricular leukomalacia to spina bifida and Down syndrome. During the first year of the program, 6 EI providers participated, then 11 additional EI providers joined in the second year of the program, for a total of 17 EI providers. The providers' disciplines included speech-language pathology, child development, special education, physical therapy, and occupational therapy (Olsen, Fiechtl, & Rule, 2012). The authors found statistically significant evidence that,

"Coaching occurred more often during VHVs than home F2F [Face to Face] visits" (Olsen et al., 2012). These articles provide evidence that utilizing teleintervention for delivery of EI services is used successfully across professions.

As service providers and parents continue to see the positive outcomes associated with teleintervention, the demand for such services will continue to sweep the field of deaf education. Though the current research is showing positive outcomes for children with hearing loss whose families have chosen to pursue a listening and spoken language outcome, the research is still limited due to the recent development of teleintervention within the field of deaf education. Therefore, more research, with a greater number of participants, is necessary to truly provide evidence that allows the above noted results to be generalized to the wider population of children with hearing loss and their families who have chosen a listening and spoken language outcome.

VIII. Benefits of Teleintervention

Early intervention services delivered via teleintervention provide many benefits for children with hearing loss, their families, and service providers. According to a review of telepractice services delivered to families with young children, birth to 2 years, with a disability or developmental delay, the Part C state performance showed improvements in the following areas: timely receipt of services, meeting the requirement of providing services in the most natural setting, infant and toddler outcomes, family outcomes, meeting the requirements of child find and the forty-five-day timeline, and finally transitions (Houston & Stredler-Brown, 2012). Studies have shown that teleintervention facilitates coaching, which leads to increased parent buy-in and greater child outcomes. Additional benefits may include, professional development

opportunities, teaming, scheduling the IFSP, recording the session for parent and/or professional use, and fewer cancelled appointments.

Teleintervention opportunities reach beyond the delivery of early intervention services and allow professionals to engage with one another in regards to professional development or the needs of a specific child and family. Though deafness is a low-incidence disability, it is found to have a high rate of co-morbidity, so it is often the case that a child and family will be working with professionals other than the hearing specialist. It can be difficult for parents and service providers to schedule times to engage in the collaboration of professionals, known as teaming, in which all providers are working toward similar goals for a child and family. Further, professionals and families must schedule time to come together for IFSP meetings and 6-month reviews. These issues are especially true for families that live in rural areas. Teleintervention can alleviate the stress of scheduling such meetings by allowing professionals and families to work together through video conferencing and accomplish the same goals they would in-person.

Teleintervention also allows for recording sessions. This could be useful for the service provider who may want to watch the session to formulate specific feedback and to help her plan for the next session. This could also benefit families if one parent misses a session and wants to catch up by watching the recording or if a care provider has trouble remembering how she was coached in facilitating language during a specific activity. Further, studies have shown that parents miss fewer appointments than they do with in-home services and are highly satisfied with their teleintervention services. Parents who were surveyed by Behl and colleagues after the pilot study out of Utah State University said, “There were fewer missed appointments due to illness and I got a lot of new insights about how to provide assistance to my child” (Behl et al., 2013). Further, the authors state, “after about 3 months, families in the TI [teleintervention] group were

asked to rate their satisfaction on a 10 point scale with 10 being highly satisfied. The average rating was 6.9" (Behl et al., 2013). In the Connect*Hear* program, parent surveys revealed that parents receiving teleintervention services reported high confidence in the following areas: acting as the primary interventionist, ability to independently target goals, and creatively thinking (i.e., using a variety of materials) (Lalios, 2012). This parent satisfaction leads to parent buy-in, which studies have shown creates greater outcomes for children's development of listening and spoken language.

IX. Drawbacks of Teleintervention

Though teleintervention provides opportunities for children with hearing loss and their families who may have otherwise received delayed or less than optimal services, it does have drawbacks that need to be taken into consideration. While the literature reveals a high level of comfort with technology on both the part of the service providers and parents, some families still prefer a face-to-face session and do maintain a level of discomfort with technology. As with any technologically-based practice, technological difficulties may arise, such as access to the Internet, poor connectivity, and high periods of latency. Finally, when working with children and families, it is vital to maintain compliance with the requirements of the Health Insurance Portability and Accountability Act (HIPAA) to ensure the family's privacy and protection.

The demand for teleintervention services began due to a lack of services in rural areas, yet the rural areas are also the last to receive access to quality Internet service providers and technology. Poor connectivity and high periods of latency can affect the quality of a teleintervention session and it is therefore necessary that the potential technological issues be addressed prior to beginning teleintervention sessions. Though access to reliable technology and

Internet connection is a concern, The Pew Research Center's 2014 survey showed that 81% of American's use computers, 90% have cell phones, 2/3 of which use their cell phones to go online, and 87% of American's use the Internet (Pew Research Center, 2014). As technology continues to advance, these numbers are likely to rise, which means the issue with teleintervention will be less about access to technology and more about privacy.

Utilizing technology for information that may be medically sensitive and involves children complicates the process from the initial phase. It is important that the rights of the child and family are protected and kept private; therefore measures must be taken to ensure compliance is maintained to meet the requirements of HIPAA. HIPAA compliance will depend on the technology being used in individual teleintervention sessions. Olsen et al. stated, "Because the security of the systems used did not meet privacy requirements of the Health Insurance Portability and Accountability Act (HIPAA, 1996), but did meet the Family Education Rights and Privacy Act (FERPA, 2008) requirements associated with Part C of IDEA, families signed an informed consent detailing the security risks associated with videoconferencing" (Olsen et al., 2012). Consent forms are one option, while purchasing HIPAA compliant technology is another. However, this equipment is expensive and would negate the benefit of teleintervention as a cost saving option for delivery of early intervention services. Recently, in an article published on CNN.com about BabyTalk, a teleintervention program out of Weingarten Children's Center in Redwood City, California, author Kelly stated that the program used encrypted iPads for HIPAA compliant teleintervention sessions (Kelly, 2015). Regardless of the approach taken by the teleintervention program, it is a consideration that must be resolved before conducting teleintervention sessions.

X. Conclusion

Traditional in-home early intervention services have shown great success in helping families and their children with hearing loss to achieve a listening and spoken language outcome. However, with developments in technology, teleintervention has and is continuing to become a valid option for service delivery. Despite teleintervention originating to overcome barriers of distant and remote locations, it is evolving along with the age of technology to show its viability as a resource for all families seeking to facilitate their child's development of listening and spoken language. Further, the use of teleintervention is shown to support the development of a triadic relationship between EI provider, caregivers, and children with hearing loss that is necessary as early intervention service delivery shifts from a therapy model to a coaching model.

Current literature provides compelling evidence that the teleintervention service delivery model is a useful platform for encouraging EI providers to coach parents to become their child's primary interventionist and carryover strategies and techniques into their everyday lives. As parents gain confidence implementing listening and spoken language facilitation techniques with their child, they become more confident and comfortable in balancing their role as parents and listening and language facilitators. As parents' skills develop and become a natural part of their interactions with their child, the child's everyday life is filled with teachable moments from a qualified practitioner, their parent. The child's teachable moments are no longer restricted to the one-hour per week the early interventionist is spending with them. As a result, the child's listening and spoken language outcomes may develop at a more age appropriate rate, comparable to their hearing peers.

As technology continues to advance, the field of deaf education will have the opportunity to adapt with the changing times by utilizing teleintervention with families and children with hearing loss. As more studies evaluate the effectiveness of the teleintervention service delivery model for families and children with hearing loss utilizing a listening and spoken language approach, the benefits may encourage the use of teleintervention as best practice in delivering early intervention services, or at least encourage the use of the coaching model to be more stringently utilized by early interventionists providing the traditional in-home service delivery. In any case, current research shows that the coaching model leads to parent buy-in, which in turn results in greater outcomes for children learning to listen and talk and this is accomplished through the use of teleintervention. With this knowledge and continued improvements in technology and service delivery, enhancements in teleintervention can aid early intervention programs in the common goal within deaf education: greater outcomes for children with hearing loss.

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